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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/199,305	11/25/1998	KENJI OHSAWA	P98.2198	3558

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EXAMINER

THAI, LUAN C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/199,305

Applicant(s)

OHSAWA ET AL.

Examiner

Luan Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 11-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 11-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office Action is responsive to the Appeal Brief filed July 19, 2002.

1. After the further review of the application, the Examiner feels that some reference is needed for the proof of the obviousness applied in the previous Final Office Action, paper number 22, dated September 11, 2002. Therefore, the above mentioned Final Office Action is hereby rescinded. The Examiner regrets for any inconvenience may have caused by the withdrawal of the previous Final Office Action and substituting a new Final Office Action. The new Final Rejection based on the cited prior arts and newly cited reference(s) is following.

#### ***Claim Objections***

2. Claims 1, 11, and 15 are objected to because of the following informalities: In claims 1, 11, and 15, the recitation of "a base comprising an insulating resin and having electrode-forming holes ***with a diameter of 22 mm or less***" should be changed to --a base comprising an insulating resin and having electrode-forming holes ***with a diameter of 0.22 mm or less***" as disclosed in the applicant's specification (page 5, lines 22-25, and page 22, lines 10-15). Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims **1-2 and 11-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al. (5,976,912 of record) in view of Kata et al (5,897,337).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims **1-2**, Fukutomi et al. (figures 1-25, specifically figures 25c-25g) show a semiconductor device comprising: a plurality of wiring films 82 form on a front surface of a base comprising an insulating resin 83 and having electrode-forming holes 84, the surfaces of the wiring films 82 and the surface of the base 83 being positioned on the same plane and a part of the wiring films 82 overlapping with the electrode-forming holes 84; a conductive material 88 embedded into the electrode-forming holes 84 to form external electrodes on the back surface, away from the wiring films, of the base; a semiconductor element 85 positioned on the front surface of the base with an insulating film 86 there between, the back surface of the semiconductor element being bonded to the front surface of the base; and wires 100 for bonding the electrodes of the semiconductor element (Col. 26, lines 32+) to the corresponding wiring films; and

a resin 87 sealed the semiconductor element and wires. Fukutomi et al fail to teach the diameter of the electrode-forming holes (i.e., 22 mm or less).

An insulating carrier having electrode-forming holes with a diameter of 22 mm or less, however, is conventionally used in the art, as disclosed by Kata et al (column 9, lines 44+). It would have been obvious to one skilled in the art to form the electrode-forming holes with the diameter as claimed since the electrode-forming holes having the claimed diameter are conventional in the art, as taught by Kata et al.

Regarding claims **11-12**, the claimed of the semiconductor device being part of "an electronic device" is taken to be inherent in the proposed device of Fukutomi et al. and Kata et al since every semiconductor device appears to be part of an electronic device.

**5.** Claim **3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al. (5,976,912 of record) in view of Kata et al (5,897,337) and further in view of Freyman et al. (5,859,475 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

The proposed device of Fukutomi et al. and Kata et al discloses all the limitations of the claimed invention as detailed above except for a metal ring bonded on the front surface of the base.

Freyman et al. while relate to a similar package design teach (see specifically figures 1-7) a metal ring 31 being bonded on the front surface of the base 201 at the exterior of the connecting sections with wires 701 in order to provide a support for the flex circuitry substrate and thereby reduces or eliminates the amount of warping during processing (Col. 3, lines 63-67). It would have been obvious to one having ordinary skill in the art to apply the metal ring as taught by Freyman et al. to the proposed device of Fukutomi et al. and Kata et al. in order to provide a support for the insulating base substrate and thereby reduces or eliminates the amount of warping during processing.

6. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al. (5,976,912 of record) in view of Kata et al (5,897,337) and further in view of McCormick et al. (5,909,057 of record).

The proposed device of Fukutomi et al. and Kata et al. discloses all the limitations of the claimed invention as detailed above with the exception of a reinforcement having a downward indented face covering the semiconductor element.

McCormick et al. while relate to a similar semiconductor device teach (see figures 2B-2F and 4A-4B) a reinforcement 214 having a downward indented face covering the semiconductor element 200 in order to prevent the semiconductor element from being warping or other wise moving during the curing step (Col. 8, lines 1+).

McCormick et al. and Fukutomi et al. are analogous art because they are from the same field of endeavor, that is the semiconductor packaging art. It would have been obvious to one having ordinary skill in the art to apply the reinforcement as taught by McCormick et al. to the proposed device of Fukutomi et al. and Kata et al. in order to prevent the semiconductor element from being warping or other wise moving during the curing step.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al. (5,976,912 of record) in view of Kata et al (5,897,337) and further in view Shim et al. (5,708,567 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

The proposed device of Fukutomi et al. and Kata et al. discloses all the limitations of the claimed invention as detailed above with the exception of vent holes formed in the base.

Shim et al. while relates to a similar semiconductor package design teaches (see figures 1-2) the base 20 having the vent holes 23 for the purpose of generating the heat from the semiconductor chip (Col. 1, lines 45+).

Fukutomi et al., Kata et al., and Shim et al. are analogous art because they are from the same field of endeavor, that is the semiconductor packaging art. It would have been obvious to one having ordinary skill in the art to apply the conventional vent holes formed in the base as taught by Shim et al. to the

proposed device of Fukutomi et al. and Kata et al. for the purpose of generating the heat from the semiconductor chip.

8. Claims **14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al. (5,976,912 of record) in view of Kata et al (5,897,337).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

The proposed device of Fukutomi et al. and Kata et al. (see specifically Fukutomi et al.'s figure 25g) discloses all the limitations of the claimed invention as detailed above with the exception of a nickel layer covering the copper layer of the wiring film. In other embodiments (e.g., Fukutomi et al.'s figures 22c-22g and 17a-17g), Fukutomi et al. teach a copper wiring layer 63 (or 33 in Fig. 17) is covered by a nickel layer 64 (Col. 23, lines 10-39 and Col. 16, lines 16-37) for being protection form the oxidization. It would have been within the general skill of a worker in the art at the time the invention was made to modify the proposed device, disclosed in Fukutomi et al.'s figure 25g, by using the plated wiring layer (e.g., copper wiring being plated with nickel), as disclosed in Fukutomi et al.'s Figs. 22c-22g and 17c-17g, in order to protect the copper layer form the oxidization.

9. The following reference(s) is/are cited as of interest to this application:

U.S. Pat. No. 5,821,626 to Ouchi et al. is cited for showing an insulating carrier having through holes with a diameter of .22 mm or less (column 9, lines 57+ and lines 65+).



***Conclusion***

**10.** Applicant's arguments with respect to claims **1-5** and **11-15** have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

**11.** Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the newly added limitations in claims 1, 11 and 15 raise new issues that would require further consideration and/or search. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

**12.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone

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numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai  
September 5, 2002



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